MTP® Solutions

MPO High Performance
Fibre Optic Solutions
for Data Centres

GEM

**SMARTER
GLOBAL
CONNECTIONS**

GEM CABLE SOLUTIONS

The Right MTP Solution Reduce deployment time and improve project ROI

Demand for greater processing power, efficient data centre design and high-speed internet access means choosing the right cabling infrastructure is essential.

The Optronics MTP solution provides a high density, high performance, robust, modular solution, for fast installation of enterprise data centre and other high fibre count cabling implementation.

Cabling infrastructure designed to deliver mission-critical applications to a data network, demands reliability, speed and availability.

Rapid Deployment

A factory terminated optical fibre cabling solution is a simple, yet scalable, reliable method of network deployment. Installation time compared to traditional fibre cabling systems can be reduced by up to 75%. Simply pull, plug and complete installation on time, eliminating all unpredictable field termination variables.

High Performance and Reliability

A combination of high quality branded components and Gem Cable's manufacturing quality control guarantees products are of the highest standard. State -of-the-art MTP manufacturing facilities provide high performance assemblies for the most demanding applications.

Cost Saving

Installation time involving a costly highly qualified workforce can be reduced to a minimum. A customised tailor-made system means that there is no waste of connectors or fibre cable.

Scalability

The ever increasing demand for higher bandwidth rates requires more complex networks. A modular system is the choice to ease future expansion and for quick and easy system reconfiguration.

High Density

Thousands of optical ports can be hosted in a SAN (Storage Area Network) or contemporary data centre. The Optronics MTP system introduces high density FirstLight Prime. This is an adaptable, unique product offering as many as 144-core trunk assemblies and high density panels for cabling ducts.

Next Generation Network Proof

The evolving future protocols of 40 and 100Gbps Ethernet utilise parallel optics. With MTP connections in your network the infrastructure will be unchanged and easily fit into the new network standard topologies.

Applications

- ▶ Fibre channel - SAN
- ▶ Parallel optics
- ▶ Infiniband
- ▶ Data Centre infrastructure
- ▶ Optical backplane connections
- ▶ Optical switch and routers
- ▶ Emerging 40 and 100Gbs Ethernet

Features

- ▶ High density- from 4 up to 144 fibres in single cable
- ▶ Available with OM1, OM2, OM3, OM4 and OS1/OS2 fibre
- ▶ Compact LSZH cable standard – OFNP cable also available
- ▶ Modular solutions
- ▶ Low loss MTP Elite® versions
- ▶ Wide range of configuration options

Benefits

- ▶ Tailored solutions to meet project specifications
- ▶ Lower installation and ownership costs
- ▶ Rapid installation
- ▶ No link / termination errors
- ▶ No cable or connector waste
- ▶ High fibre density
- ▶ Reduced on site testing required

Environmental Considerations

Environmental concerns affect data centre size and growth, with constant pressure to decrease equipment footprint and save on rack space. Our high density MTP solutions require much less space than conventional cabling systems, allowing reduction in the racks and cabinets required.

In the current economic climate, operators are particularly concerned about running costs, especially power consumption. Energy efficiency is key. The high density of MTP systems and small diameter cables mean that ducts and racks are not congested allowing for improved cooling plus, at high speed, fibre channels consume less power than equivalent data rate copper channels.

Key features

▶ MTP connectors offer high precision and robust connectivity
▶ Connectors click into their adaptors and are reverse polarity protected
▶ Easy to use cable management solutions
▶ Installation is simple and fast
▶ Immune to EMI/RFI

High density

▶ Highest fibre density of any standard connector
▶ 12 fibres per connector as standard
▶ Less cable yields more space in cabinets and cable raceways, giving better airflow
▶ Up to 15,000 fibres connections per rack

Reliability

▶ Cable assemblies are factory terminated and tested
▶ State of the art termination processes
▶ Tightly managed manufacturing procedures ensure quality control

Low cost of ownership

▶ Reduces labour cost and saves time on installation and testing
▶ Reduces cost of consumables and space requirements for cabinets

Scalability

▶ Future proof network infrastructure, to protect your investment
▶ Supports 10G Ethernet and 8G Fibre Channel standards
▶ Singlemode capability beyond 10Gbps

Simplicity

▶ Modular system designed for rapid moves, adds and changes (MACs)
▶ Designed for simple and easy handling, installation and testing

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Multi Fibre High Density
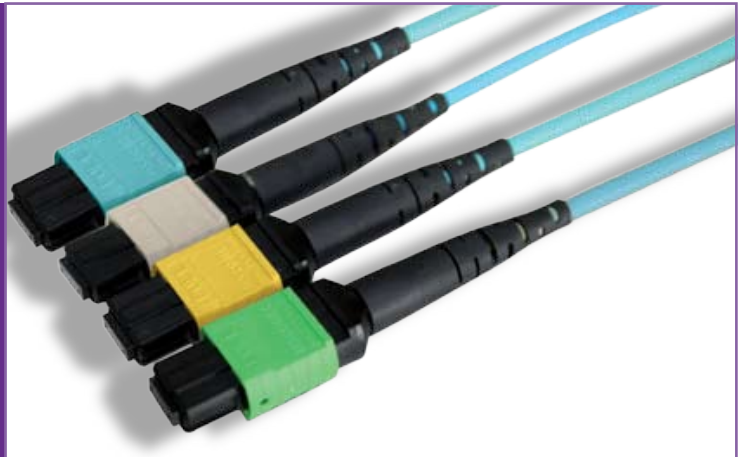
Unique

The Optronics MTP cabling solution utilises MTP branded MPO connectors manufactured by US Conec Ltd. The MTP connector provides rapid connection of 12 fibres.

US Conec MTP connector introduces many features which give technical superiority over the standard MPO design providing excellent physical and optical properties. The integrity of the connection is provided by latches within the adaptor which are secured into place on the connector with a spring loaded mechanism. Precision alignment is achieved with specially designed guide pins. MTP connectors have a unique removable housing which allows for a quick change of gender, ferrule cleaning, interferometric inspection or connector re-work.

Features

▶ Patented floating ferrule design ensures fibre contact integrity
▶ Terminate ribbon fibre or loose individual fibres
▶ Low loss and standard loss SM and MM versions
▶ Patented elliptical guide pin tip to Minimise ferrule debris
▶ Ruggedised round cable, oval cable and bare ribbon options available
▶ Housing is removable for quick change of pin clamps and easy ferrule cleaning / re-polishing
▶ Alignment achieved with high precision guide pins
▶ Family of bulkhead adapters available

Patented
Floating
Ferrule

12.6

1.0

60.2

1.9

7.6
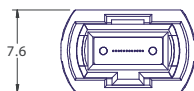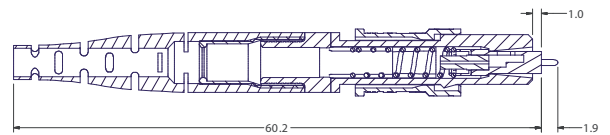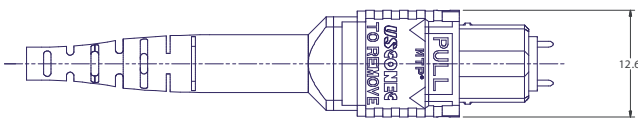
Connector Performance Specifications

	MTP Elite ˙ Singlemode MT Ferrule	Standard Singlemode MT Ferrule	MTP Elite ˙ Multimode MT Ferrule	Standard Multimode MT Ferrule
Insertion Loss	0.10dB Typical 0.35dB Max	0.25dB Typical 0.75dB Max	0.10dB Typical 0.35dB Max	0.20dB Typical 0.6dB Max
Return Loss	>55dB (Angle Polish)	>55dB (Angle Polish)	>20dB	>20dB
Operational Temp	- 40 ˙C to + 70 ˙C	- 40 ˙C to + 70 ˙C	- 40 ˙C to + 70 ˙C	- 40 ˙C to + 70 ˙C

Enterprise data centre topology

The amount of enterprise data transmitted and stored is continuing to grow exponentially. Data centres which host a large number of interconnections between servers, switches and storage devices are especially affected. Contemporary SAN (Storage Area Network) can contain thousands of FC (Fibre Channel) ports. Mission-critical applications require the highest reliability, as no downtime is acceptable. New trends and technologies like server virtualisation will require even more bandwidth and increase the demand for high density low insertion loss cabling.

Telecoms room and offices

Primary entrance room

Access providers — Primary Entrance Room — Access providers

Offices, Operations Centre, Support Room

Backbone cabling

Horizontal cabling

Main Distribution Area

HC — Backbone cabling — MC

Telecom Room

Secondary Entrance Room

Access providers

Backbone cabling

Backbone cabling

Backbone cabling

HC   HC   HC

Horizontal Distribution Area

Horizontal cabling

Horizontal cabling

Horizontal cabling

Horizontal cabling

Interconnect

Zone Distribution Area

Horizontal cabling

Interconnect

Active Equip
Storage Area Device

Interconnect

Active Equip
Storage Area Device

Interconnect

Active Equip

Active Equip
Storage Area Device

Equipment Distribution Area

Data centre cabling infrastructure guidance was introduced by standard bodies in Europe (EN50173-5) and America (TIA/EIA-942);

Entrance Room
The primary entrance room is the demarcation point between the access provider and the data centre cabling.

Main Distribution Area (MDA)
The main distribution area is the centre of the cabling system including the main cross-connect.

Horizontal Distribution Area (HDA)
The HDA is the transition point between backbone and horizontal cabling.

Zone Distribution Area (ZDA)
If additional cross connect between the HDA and active equipment is needed- zone distribution area is implemented.

Equipment Distribution Area (EDA)
The equipment distribution area houses the racks and cabinets that hold the computing and storage modules.

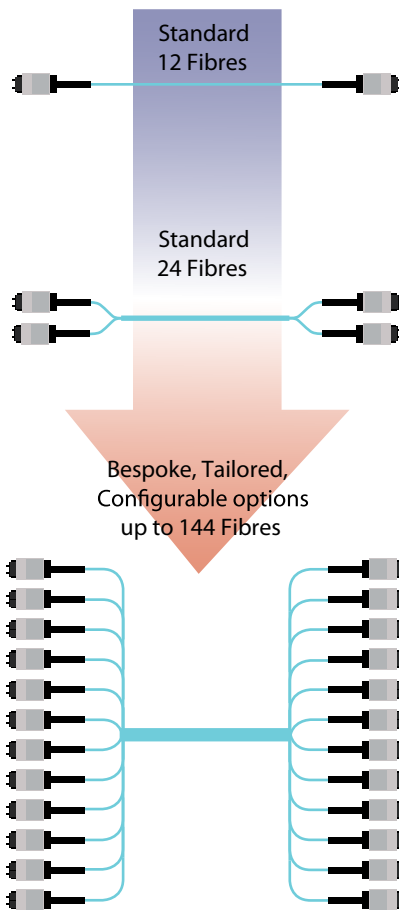## Data centre

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System Components

The Optronics MTP System is the ultimate solution for current and next generation Data Centre requirements. This high density, scalable system is designed to enable thousands of connections, whilst the modular design improves troubleshooting and reconfiguration during moves, adds and changes (MACs). Flexibility and component diversity means MTP systems can serve multiple topologies, utilising a variety of protocols such as Fibre Channel, Ethernet or Infiniband.

Hybrid Assemblies Available

MTP Trunk Cables	MTP Ruggedised Fan Outs	MTP Cassettes

MTP Trunk cables provide backbone interconnection between Data Centre distribution zone areas like MDA, HDA and EDA and provide patching for parallel transceiver or array equipment. They are offered in standard 12 and 24 core versions in addition to the FirstLight Prime design platform for up to 144 core assemblies.
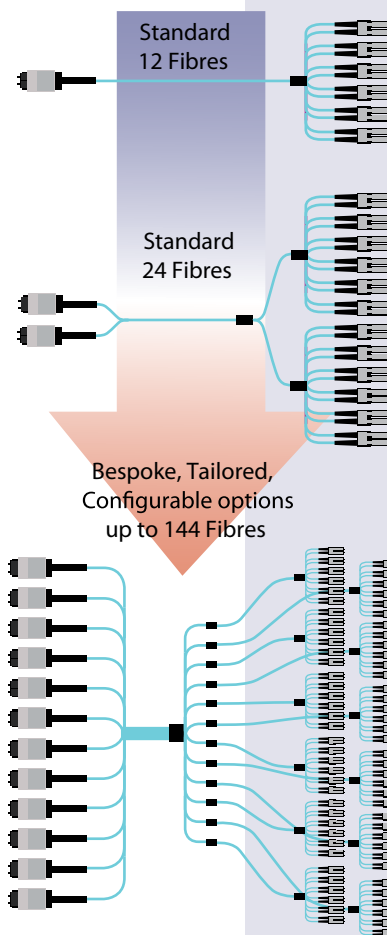
The ruggedised hybrid fan outs can be terminated with MTP connectors on one end and duplex/simplex discreet connectors (LC, SC, ST) on the other.

MTP breakout cords are used for direct equipment connection to trunk or MTP cassettes, easing rack congestion and improving channel power budget.

FirstLight Prime technology allows as many as 12 MTP connectors to be mapped to as many as 144 discreet connectors.
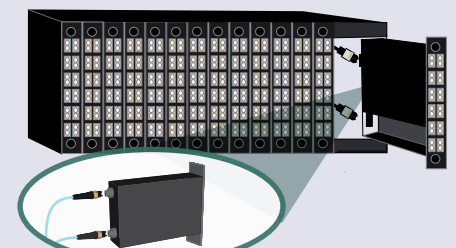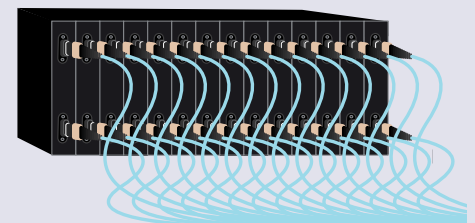
Modules are used to link 12 or 24 fibre MTP trunk connectors to LC or SC connectors. Modular system facilities can patch into system equipment ports, patch panels or work outlet areas.

Modules can be installed in 1U and 3U system, scaling up to as many as 336 ports.

Standard
12 Fibres

Standard
12 Fibres

Front view

Standard
24 Fibres

Standard
24 Fibres

Rear view

Supports up to 336 fibres

Bespoke, Tailored,
Configurable options
up to 144 Fibres

Bespoke, Tailored,
Configurable options
up to 144 Fibres

First Light Prime
High Density Solution

FirstLight Prime is a design platform specified for high fibre core count assemblies from 4 up to 144 cores. Made for rapid and easy deployment of high density fibre infrastructure, both MTP discreet connector trunks and ruggedised fan out assemblies utilise innovative design breakout modules. The cables can withstand 1000N pulling strength making these assemblies the choice for both long backbone or high core count trunks.

www.gemcable.co.uk

The 1U MTP modular patch panel can host up to 3 MTP modules. 72 LC front ports can be interfaced with MTP trunk assemblies. Cassettes are easy to install and can be quickly reconfigured providing efficient MAC time. MTP modules can be replaced with 8 MTP adaptor plates for direct trunk cable to fan out interface.

MTP trunk cable to modular patch panel

Fibre Count Supports up to 72 fibres

Typically
72 Fibre LC or 24 MTP = 288 Fibres

❖ For ordering information see p16

MTP trunk cable to pre loaded 1U slimline patch panel

The slimline panel is used to break out up to four 12-fibre MTP trunk connectors. The factory terminated and tested optical fibre assembly connects the front adapters to the back MTP interface. The 1U height panel can hold up to 48 LC connectors. The slimline panel is designed to complement the modular system. The rear entry is accessible and deployment time can be reduced to minimum.

Fibre Count Supports up to 96 fibres

Typically
48 Fibre LC

❖ For ordering information see p14

MTP modular Chassis

For high fibre density 3U MTP modular chassis can host up to 14 MTP modules with up to 336 LC connectors. The MTP adaptor plate for direct interfacing trunk with MTP ruggedised fan out assemblies increases chassis capacity to 1344 fibres reducing channel IL (Insertion Loss) and racking space. The 8 MTP adaptor place can also be installed to provide a direct trunk cable to fan out interface.

❖ For ordering information see p15

Fibre Count Supports up to 336 fibres

Typically 12 Duplex LC = 336 Fibres
112 x MTP = 1344 Fibres

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High Density

Flexible Architecture

Advanced Technology

The Data Centre Topology

MTP
Breakout Cable

MTP
Trunk Cable

Active Equipment/Storage

MC
Main Cross Connect

1   2   3 4   5
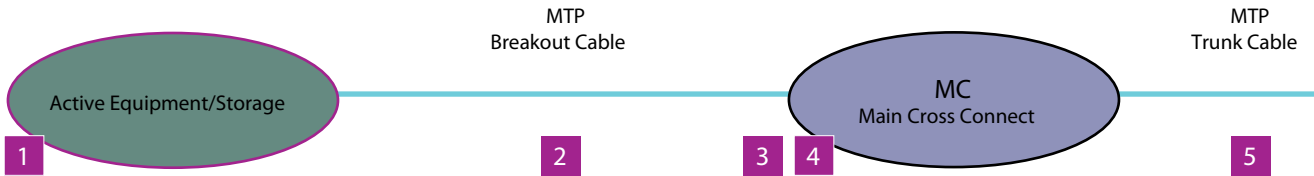
Example Architecture

San Director Cabinet

1

4

5

8

3

2
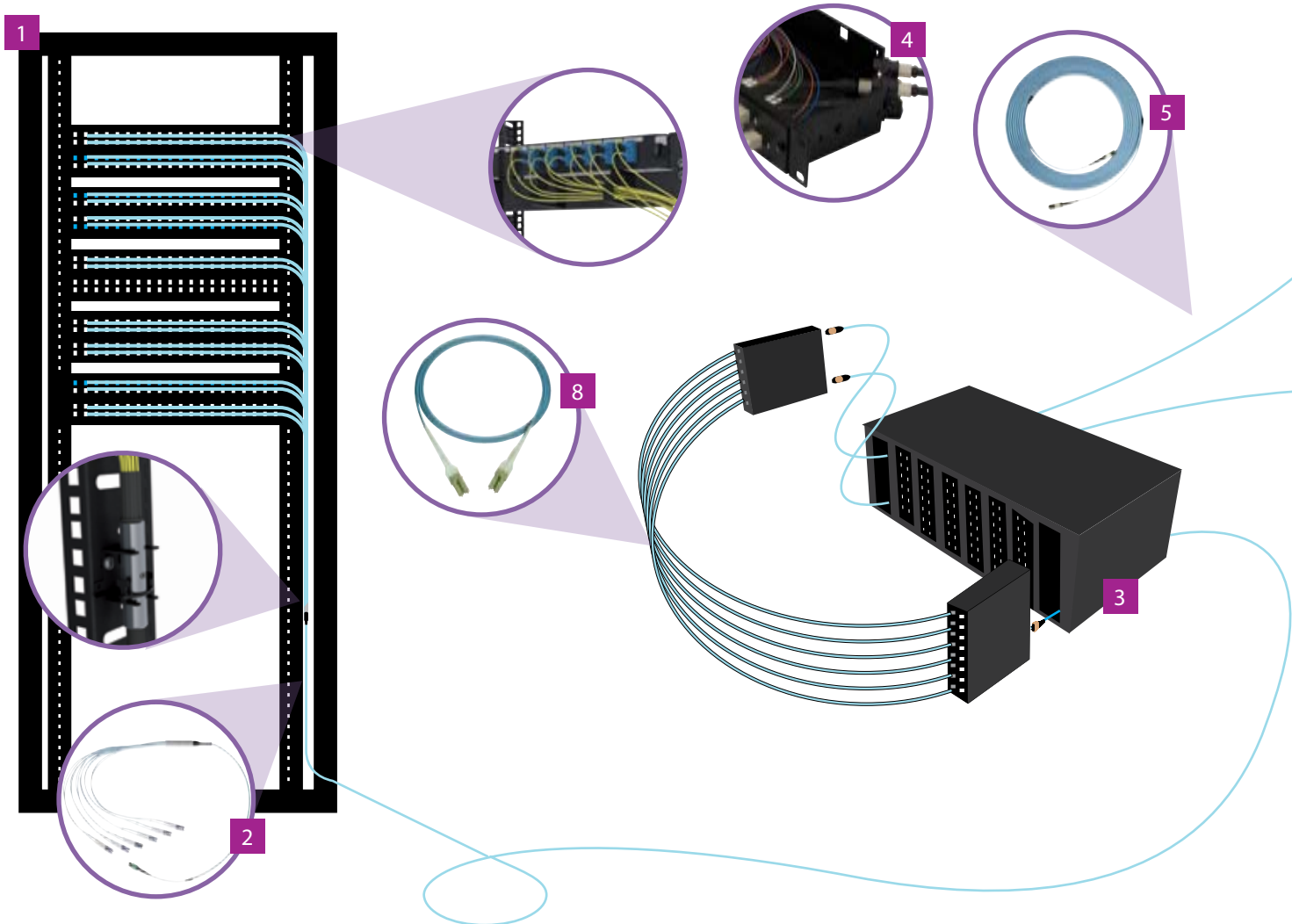
| 1 | SAN Director Cabinet | 2 | MTP Breakout Cable | 3 | MTP Modular Patch Panel | 4 | MTP Slimline Patch Panel |

GEM CABLE SOLUTIONS
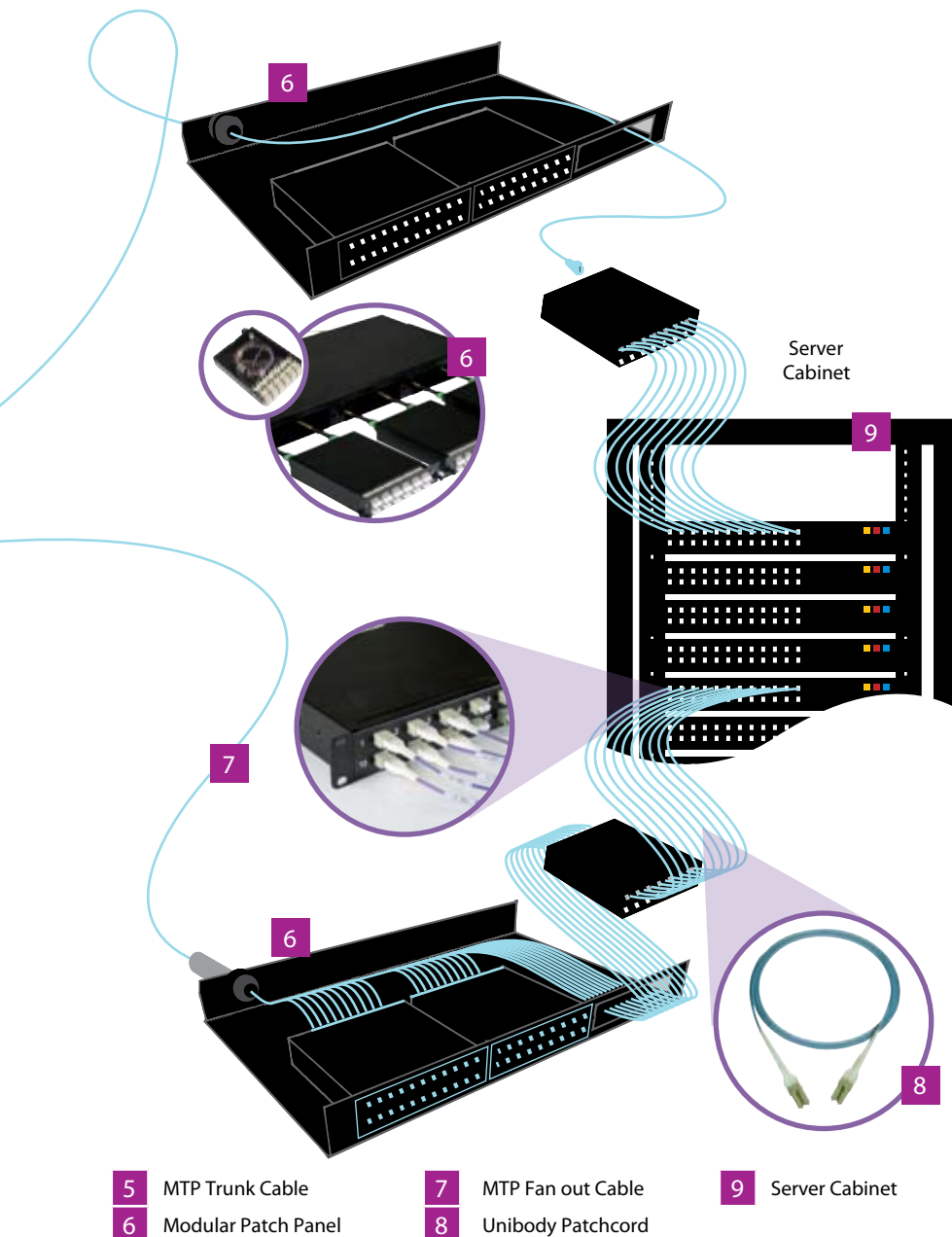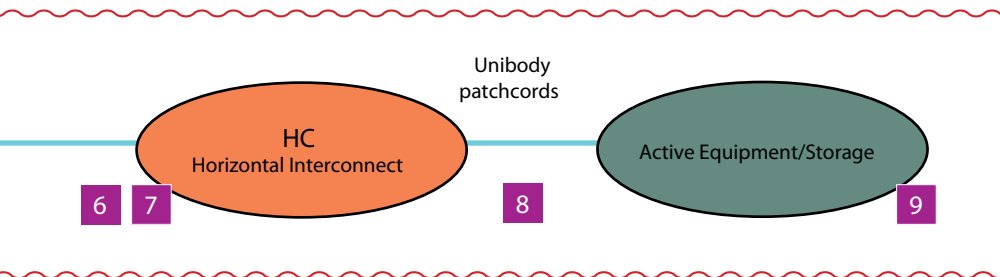
The Problem

In the enterprise environment all data must be stored and archived by SAN. Data centre backbone products like SAN directors support hundreds of optical ports therefore single cabinets must host thousands of optical interconnections and patchcords. Storage area networks must feature high density and modularity for easy reconfiguration of cabling infrastructure. The Implementation of high bandwidth SAN protocols like 8 and 10Gb Fibre Channel (FC) products yields a reduced power budget.

Unibody patchcords

HC
Horizontal Interconnect

Active Equipment/Storage

6   7   8   9

6

6

7

6

Server Cabinet

9

8

The Solution

Gem Cable next generation networks solution includes low loss connectors, OM4 fibre and collapsed network infrastructure products plus MTP fan outs and trunks which can be directly connected to active equipment.

Low loss Elite ® family components can reallocate power to cover losses of longer cabling infrastructure. The reduction of interconnection through direct connection to active equipment saves valuable power budgets thereby contributing to an efficient network operation.

Cassette modules

Cassette modules are typically used in lower fibre count break out applications such as server cabinets and can also be used to build up high fibre count interconnects.

Direct Harness / SAN Director Cabinet

The Director cabinet interconnects servers with storage. One Director can host as many high optical ports as 768 in a single rack. Ruggedised fan outs provide a connection between blade switch and MTP interface located in director cabinet or in main cross connect point. The FirstLight Prime design allows up to 144 core ruggedised fan out trunks to be routed directly from main distribution point resulting in SAN Director cabinet patching and power budget improvement.

Main Distribution Area

The MDA must scale a huge number of optical interconnections providing demarcation between storage, servers and switching area. The MTP modular patch panel can scale up to 1344 fibres in 3U dimension using the MTP cassettes. The modular system enables infrastructures to be easily expanded or reconfigured. The FirstLight Prime MTP backbone trunks (up to 144 cores) can be easily interconnected to up to 10,000s of optical ports between MDA, HDA or EDA.

Equipment Distribution Area

The EDA hosts patching management for active equipment or storage. 1U fixed or modular MTP panels are the choice for lower density fibre infrastructures. The MTP to LC cassettes modules can be typically used in lower fibre count applications like server cabinets.

| 5 | MTP Trunk Cable | 7 | MTP Fan out Cable | 9 | Server Cabinet |
| 6 | Modular Patch Panel | 8 | Unibody Patchcord | | |

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Channel Link Performance

We know that every network is different. Gem Cable tailor made systems guarantee best efficient and cost effective solutions.

High bandwidth protocols such as 8/10Gbps Fibre Channel (FC) and 10Gbps Ethernet require precise insertion loss budgets. When considering insertion loss budgets particular attention must be paid to the number of connections in the link.

Gem Cable's in house technical expertise and software enable us to approach network design and performance with proven experience, to accommodate any network topology, protocols and quality of interconnection

Gem Cable low loss connectors

The Elite * MTP family of premium grade MM connectors with reduced insertion losses can reallocate power to cover longer cabling runs.

High Bandwidth Fibre - OM4

Using high bandwidth fibre, dispersion is lowered and it is possible to reduce the ISI penalty and reallocate power the resulting power loss.

Reduced Topology – MTP to active equipment

The reduction of interconnections from direct connection to active equipment saves valuable power budgets which also contributes to an efficient network operation. The MTP fan out assembly is ideal for use between active equipment like blade servers and HDA (Horizontal Distribution Area) reducing MTP to LC cassette components.

"In a complex enterprise data centre environment the total number of interconnections can be high. The Gem Cable low loss connectors and high bandwidth fibre cable can enhance the overall network performance and efficiency."
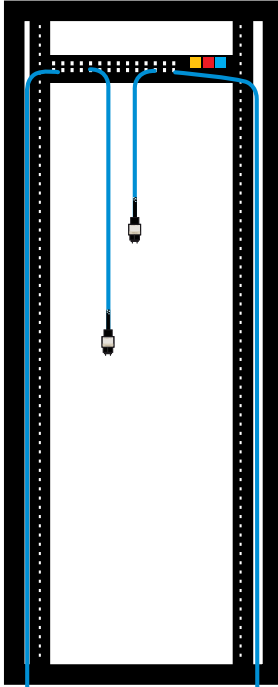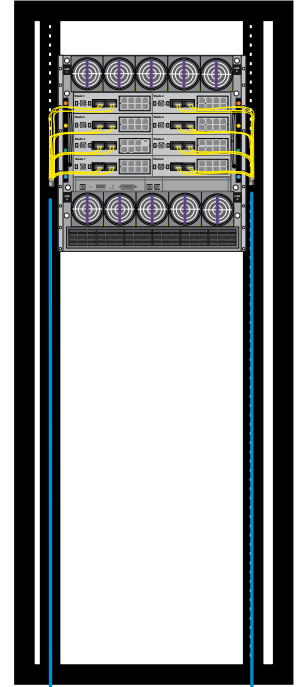
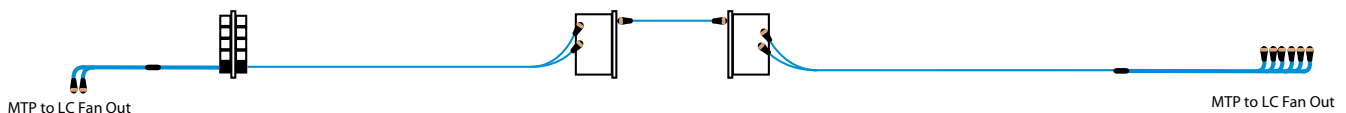Equipment Cabinet (ECA)   Main Distributor (MDA)   Equipment Cabinet (ECA)

MTP to MTP Panel

LC to MTP Modules

MTP to LC Fan Out

MTP to LC Fan Out

GEM
CABLE SOLUTIONS
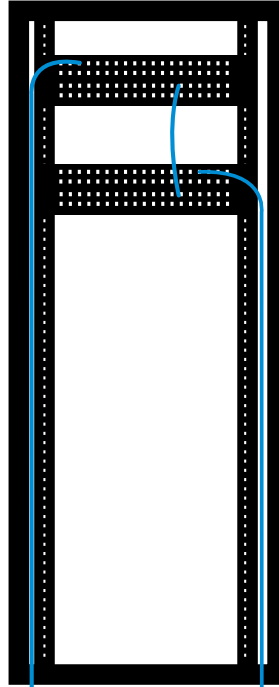
Your System Your Choice

The modular nature of our MTP system means it is totally flexible. We understand there is no such thing as a "standard" installation. In Data Centres, there are many different cable routes, requiring varying cable lengths, not to mention the different polarity configurations that may be required. We can supply factory tested products, tailored to your requirements and offer assistance with physical layouts to maximise space efficiency and enable potential for growth and flexibility in the future.

From the smallest project to multi-site installations we will deliver the right solution for you, on time, tested and ready for installation.

► Patch panels and cassettes are configured and labelled to meet your needs.

► Trunk cables and ruggedised fan out assemblies are made to the lengths you need.

► Bespoke packaging of products can be supplied to suit your requirements.

Typical data centre installation system components.

1. Trunk cables   P11

MTP to MTP trunk cables for backbone application interconnecting data centre distribution zone areas like MDA, HD and EDA and providing patching for parallel transceiver or array equipment. Offered in standard 12 and 24 core versions in addition to up to 144 core.

2. Ruggedised fan out   P12

The ruggedised hybrid fan out for the transition from multi fibre MTP ferrule to simplex or duplex connectors. Used for direct connecting active equipment to MTP trunks negating the need for interconnecting patching.

3. FirstLight Prime ® module   P13

Gem Cable Optronics FirstLight Prime System is specified for high core quantity (4 - 144) or long length trunks assemblies. MTP to MTP trunk or MTP ruggedised fan out assemblies utilise a unique breakout module which can withstand 1000N pulling strength. The small size is ideal for high cabling congestion applications like backbone cabling or SAN director racks connections.

4. Unibody patchcords   P14

The unibody duplex LC patchcord utilises 3mm round cable. The round cable allows multidirectional patchcord bending. The unibody and common boot improves physical strength, making assemblies more rugged.

5. Slimline patch panel   P15

The MTP slimline 1U patch panels have a reduced depth to provide the opportunity to locate additional equipment at the rear of the rack or maximise airflow within the rack.

6. Modular components & polarity   P16

The MTP modular patch panel can receive a variety of configurations from a LGX plate to a sliding cassette. This reduces installation time in addition to reconfiguration work.

7. Installation accessories   P19

It is always critical to inspect the connector cleanliness before connection. Mating contamination is responsible for most network down times. Gem Cable's installation accessories like the MTP/MPO cleaning tools are ideal for ensuring cleanliness and undisrupted network deployment.

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1. Trunk cables

Trunks terminated with MTP connectors combine space saving features in a high density application, offering rapid deployment with high optical performance. The MTP interface guarantees next generation network compatibility and easy transition to parallel optics systems. Trunk assemblies are available with 12 and 24 core microcore cable. High fibre count configurations (up to 144 cores) are available within the innovative FirstLight Prime Solution. Trunks are available with standard as well as premium family Elite* for most demanding application.

Features and Benefits

▶ OM1, OM2, OM3, OM4 and OS1/2
▶ LSZH and OFNP available
▶ Standard and Elite* premium connectors

▶ Round microcore cable for ease of cable rooting
▶ Factory terminated and tested
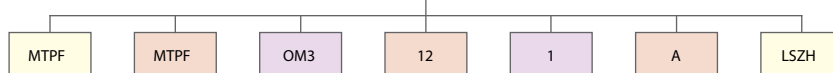▶ Easy upgrade to parallel optics

MTP Trunk Cables Part Number Generator

Please select a code from each coloured section displayed below to create your specific MTP trunk cable.
Place all of the codes together in order to generate your part number.

Connector END A		Connector END B		Fibre type		Fibre count	Cable length	Polarity method	Jacket type
Female standard	MTPF	Female standard	MTPF	OS1/2	09	8	Made to measure 1-9999M	A	LSZH
Female Elite*	MTPEF	Female Elite*	MTPEF	OM1	62	12		B	OFNP
				OM2	50	24		C	
				OM3	OM3	48	From 1m to 300m		
				OM4	OM4	72			
						96			
						144			

Example Part Number

MTPFMTPFOM3121ALSZH

MTPF	MTPF	OM3	12	1	A	LSZH

This part number has created a female to female, OM3, 12 Core, 1 metre, polarity method A, LSZH MTP trunk

2. Fan out assembly

The MTP to LC fan out or trunk assembly combines a MTP connector on 1 end and discreet connectors on the other. It is quick to install and provides a cost effective option for creating direct connections to active equipment when cassettes cannot be installed in close proximity to the equipment, when a high density connection is required or where power budgets impose a lower number of interconnections. MTP to LC fan outs, usually 12 and 24 core are typically used within the same cabinet. The FirstLight Prime fan outs provide a platform for high fibre count or long length MTP to LC trunks assemblies where long intercabinet connections are required.
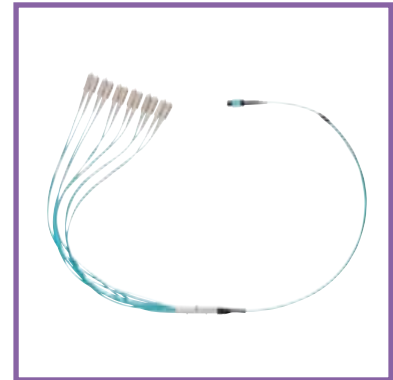
Features and Benefits

▶ Application specific design - up to 144 fibre in FirstLight Prime Trunk Fan out

▶ Multiple fibre types - OM1, OM2, OM3, OM4, OS1/OS2

▶ Factory terminated and 100% tested

▶ Minimise server/SAN director cabinet patchcord congestion

▶ Reduced topology improves power budget

MTP MPO Fan out Assemblies Part Number Generator

Please select a code from each coloured section displayed below, to create your specific MTP MPO Fan out cable. Place all of the codes together in order to generate your part number.

Connector END A		Fibre count		Connector END B		Fibre type		Cable length	
Female standard	MTPF		12		LC	OS1/2	09	Made to measure 1-9999m	
Female Elite *	MTPEF		24		FC	OM1	62		From 1m to 300m
Male standard	MTPM				ST	OM2	50		
Male Elite *	MTPEM				SC	OM3	OM3		
						OM4	OM4		

Example Part Number

MTPF12LCOM31

MTPF	12	LC	OM3	1
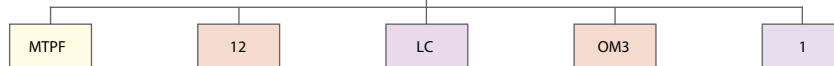
This part number has created a female to female OM3, 12 core, 1 metre, MTP trunk cable.

3. What's the difference with FirstLight Prime® ?

The Optronics FirstLight Prime is the family of premium optical fibre assemblies, utilising the patented FirstLight Prime transition module. The de - sign can offer assemblies from 4 to 144 core fibre cables and guaranteed superior tensile strength and crush resistance (true 1000 Newton pulling strength). This technology platform is the ideal choice for long trunks requiring improved physical properties or high core count trunk assemblies. These cables can be assembled with both MTP and discreet connectors. FirstLight Prime can also be used as trunk ruggedised MTP fan outs, providing cabinet to cabinet connections without the need of fibre jumpers. Innovative dry loose tube cable construction offers superior physical and optical performance.

▶ 4-144 fibre counts
▶ Modular design
▶ Can be secured to cabinet mounting profile for saving space zero-U solutions
▶ High tensile strength and crush resistance
▶ Compact cable and module dimension easing duct and rack congestions
▶ Reduced interconnection topology improves power budget

3. FirstLight Prime® Module

The Optronics MTP high density solution utilises the patented FirstLight Prime transition module. This cutting edge cable transition unit has been meticulously designed and rigorously tested to ensure it can stand up to a wide range of applications and environments. It is manufactured using aluminium and glass reinforced polymer components which gives the module great strength and weight performance. Using this solution we are able to produce cable assemblies from 4 fibres to 144 fibres.

1000N Pulling Strength

1000N Pulling Strength
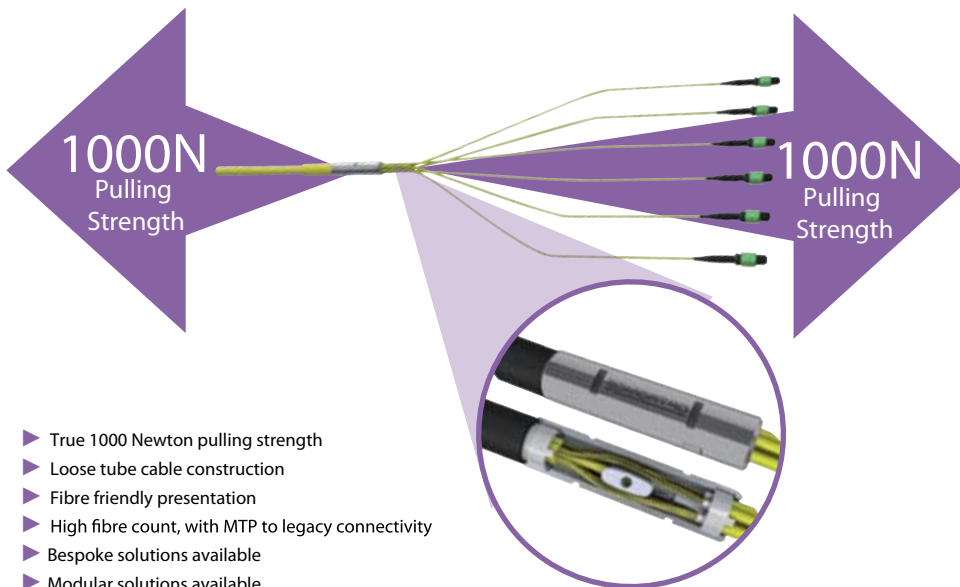
▶ True 1000 Newton pulling strength
▶ Loose tube cable construction
▶ Fibre friendly presentation
▶ High fibre count, with MTP to legacy connectivity
▶ Bespoke solutions available
▶ Modular solutions available

GEM CABLE SOLUTIONS

4. Unibody patchcords

As the networking environment of today becomes increasingly dependent on high speed and high density solutions, effective cable management is a real issue. The key concern is how to manage more cable in a smaller amount of space.

The Optronics Unibody fibre patchcord reduces cable management space by 50% compared to standard patchcords. The body of the connector also prevents users from altering the polarity of the patchcord. The patchcord utilises a special "round duplex" cable that allows duplex transmission within a single 3mm cable. As a result of these unique features the Optronics Unibody patchcord offers improved airflow and visibility of equipment within a high density network environment.

The Optronics Unibody patchcord is available in a wide variety of cable styles including LSZH, Plenum and Riser.

Features & Benefits

▶ LC or SC connectors available
▶ Full duplex in a single 3mm cable
▶ Available in OM1, OM2, OM3, OM4 and OS1/OS2 cabled fibre types
▶ Available with LSZH, Plenum and riser rated cable
▶ Cost effective
▶ Save 50% of space in cabinets and cable ways
▶ Protects network polarity

Standards

▶ IEC-61754-20
▶ IEC-11801
▶ RoHS / Reach Compliant

Unibody patchcord Part Number Generator

Please select a code from each coloured section displayed below, to create your specific Unibody patchcord. Place all of the codes together in order to generate your part number.

Connector type		Fibre type		Duplex	Cable colour		Cable length	Cable type	
	LCLC	OS1/2	09		YELLOW	OR		LSZH	L
	SCSC	OM1	62		PURPLE	PU	From 1m To 300m	Plenum	PL
		OM2	50		AQUA	AQ		Riser	R
		OM3	OM3		ORANGE	YE			
		OM4	OM4						
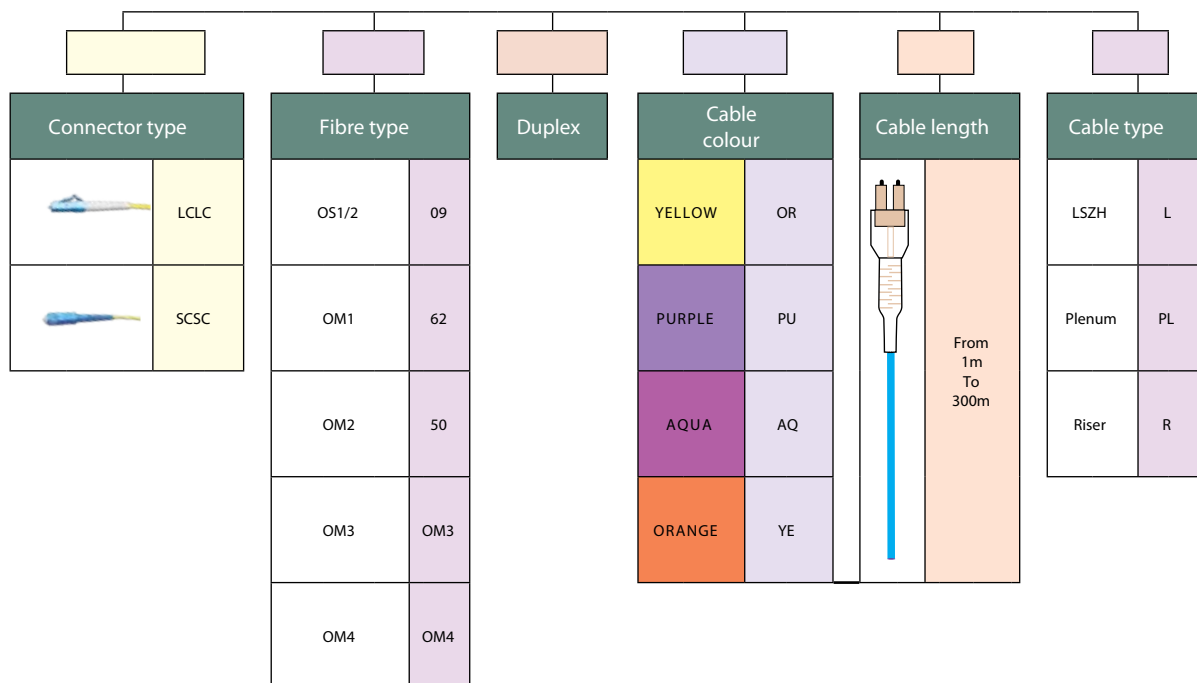
Example Part Number

LCLCOM3DAQ1UNIL

LCLC	OM3	D	AQ	1	L

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5. Slimline patch panel

The slimline patch panel is a 1U fixed panel specifically designed for MTP connection to discreet LC ports. Due to its unique design, it will hold up to 96 LC connectors on the front and 8 MTP connectors on the rear of the panel. The depth of the panel is only 145mm to allow enough room to mount further panels or equipment in the rear profiles of the cabinet. The slimline patch panel is a complementary cost effective solution to the high density modular panels and chassis for MTP-LC cassettes.

Features & Benefits

▶ Up to 96 front LC and 8 rear MTP ports
▶ Small and compact dimensions for easier rack management
▶ Easy to install one piece MTP to LC panel
▶ Easy accessible rear entries

Fibre Count Supports up to 48 fibres

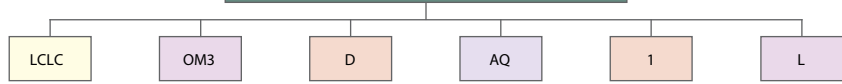## MTP Slimline patch panel Part Number Generator

Please select a code from each coloured section displayed below, to create your specific MTP MPO slimline patch panel. Place all of the codes together in order to generate your part number.

1U19BK

Adaptor END A		Adaptor END B		Fibre Type		Fibre Count
	LC	Male Standard	MTPM	OS1/2	09	12
	FC	Male Elite *	MTPEM	OM1	62	24
	ST			OM2	50	48
	SC			OM	OM3	72
				OM4	OM4	96
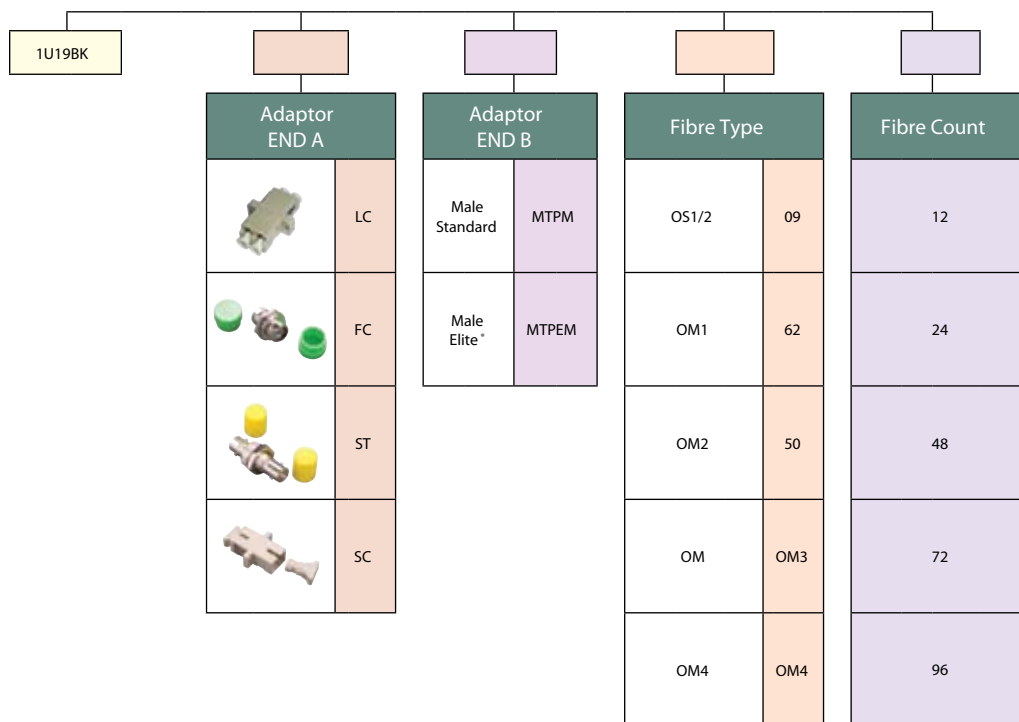
Example Part Number   1U19BKLCMTPMOM348

1U19BK	LC	MTPM	OM3	48

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6. Modular components

Modular panel - LGX Chassis

The modular 3U chassis is supplied unloaded and can support LGX cassettes or adaptor plates. The enclosure offers superior fibre density and can host up to 336 LC or 112 MTP ports providing solutions for up to 1344 fibres.

▶ High density - up to 1344 fibres per chassis
▶ MTP to LC cassettes or MTP adaptor front interface
▶ Up to 14 cassettes / adaptor plates

Part Number: LGXCHASSIS

Modular panel - LGX Cassettes

Cassette modules add extra flexibility to the high density range. When connector requirements change in the future, simply swap the cassettes whilst leaving the existing backbone infrastructure intact. MTP to LC/SC cassette modules are a quick and efficient way of deploying MTP connector breakout. Factory terminated and tested the fan out array is protected inside the cassette and is connected to the trunk via a MTP port. Discreet fibre jumpers are needed to interconnect the LGX cassette to active equipment. With up to 24 fibres in each cassette we can achieve 72 fibres in 1U or 336 fibres in 3U.

▶ 24 LC and 12 SC Interface
▶ 2 MTP rear entries
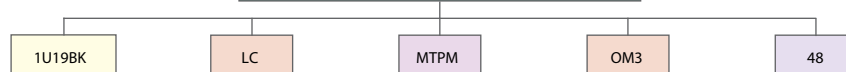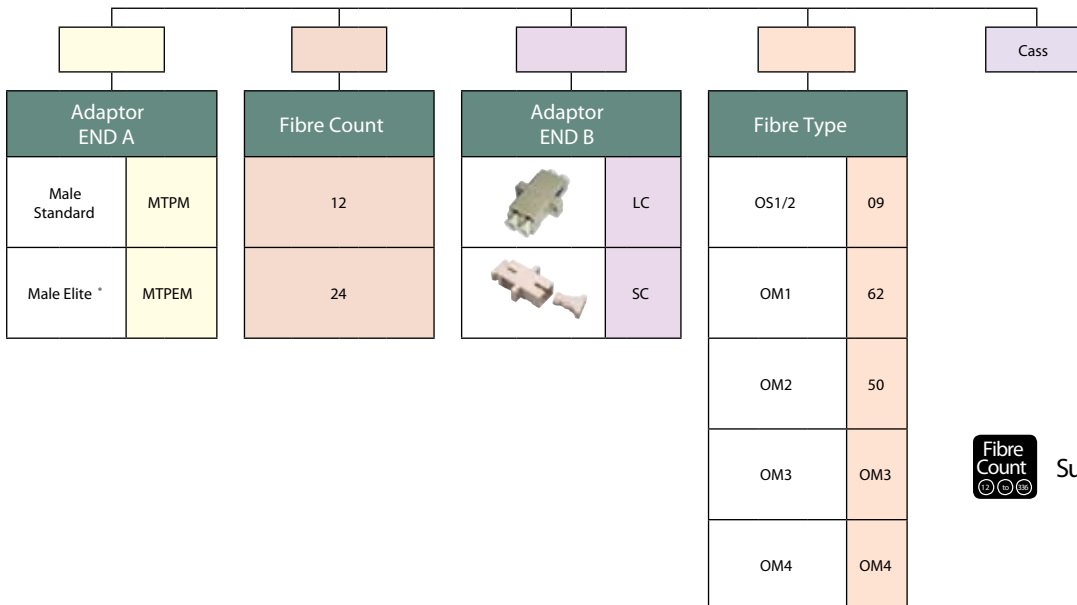▶ Modular design for quick adds, reconfigurations and changes.

MTP LGX Cassette Part Number Generator

Please select a code from each coloured section displayed below, to create your specific MTP MPO slimline patch panel. Place all of the codes together in order to generate your part number.

Adaptor END A		Fibre Count	Adaptor END B		Fibre Type		Cass
Male Standard	MTPM	12		LC	OS1/2	09	
Male Elite *	MTPEM	24		SC	OM1	62	
					OM2	50	
					OM3	OM3	
					OM4	OM4	

Fibre Count — Supports up to 336 fibres

Example Part Number   MTPM12LCOM3CASS

MTPM	12	LC	OM3	CASS
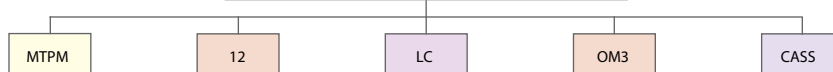
6. Modular components

Modular Panel - unloaded

The S13 patch panel system in its basic form is supplied unloaded without cassettes or adaptor plates. The tray is locked in place with two simple to operate plastic latches as are the individual cassettes or adapter plates. When fully extended the tray is designed to lower to 45°, or can be moved to the side and it will lock to a lower 10°. This provides the perfect working platform for simple installation or easy maintenance and access even after the panel is installed in the rack. The modular panel accepts up to 3 LGX cassettes or adaptor plates.

▶ Small size - 1U height
▶ Up to 3 cassettes / modular adaptor plates

Part Number: S13XXX00

Modular Panel - adaptor plate

The MTP adaptor plate offers an interconnection option between MTP connectors. It is compatible with 1 and 3U LGX chassis and allows efficient implementation of MTP extenders, jumpers and MTP to LC trunk and ruggedised fan out assemblies for direct equipment and patching interconnections. The modules allow simple upgrade paths to the future next generation networks utilizing array connectors without changing fibre management infrastructure.

▶ High density MTP interface
▶ Fits 1U and 3U modular platform
▶ Reduced channel insertion losses
▶ Next generation network proof

Part Number: L06MTP08

Modular Panel - blanking plate

Covers any unpopulated ports within the LGX chassis or S13 panel and is designed to allow simple removal for future expansion.

Part Number: L04

Migration to 40 and 100Gbps

Next generation network protocol standards rely on parallel optics and array transceivers. MTP-LC cassettes will be changed for MTP cassettes, discreet connectors in panels will be substituted with MTP adaptors.

Female   Male   Female   Female   Male   Female

6. Polarity methods
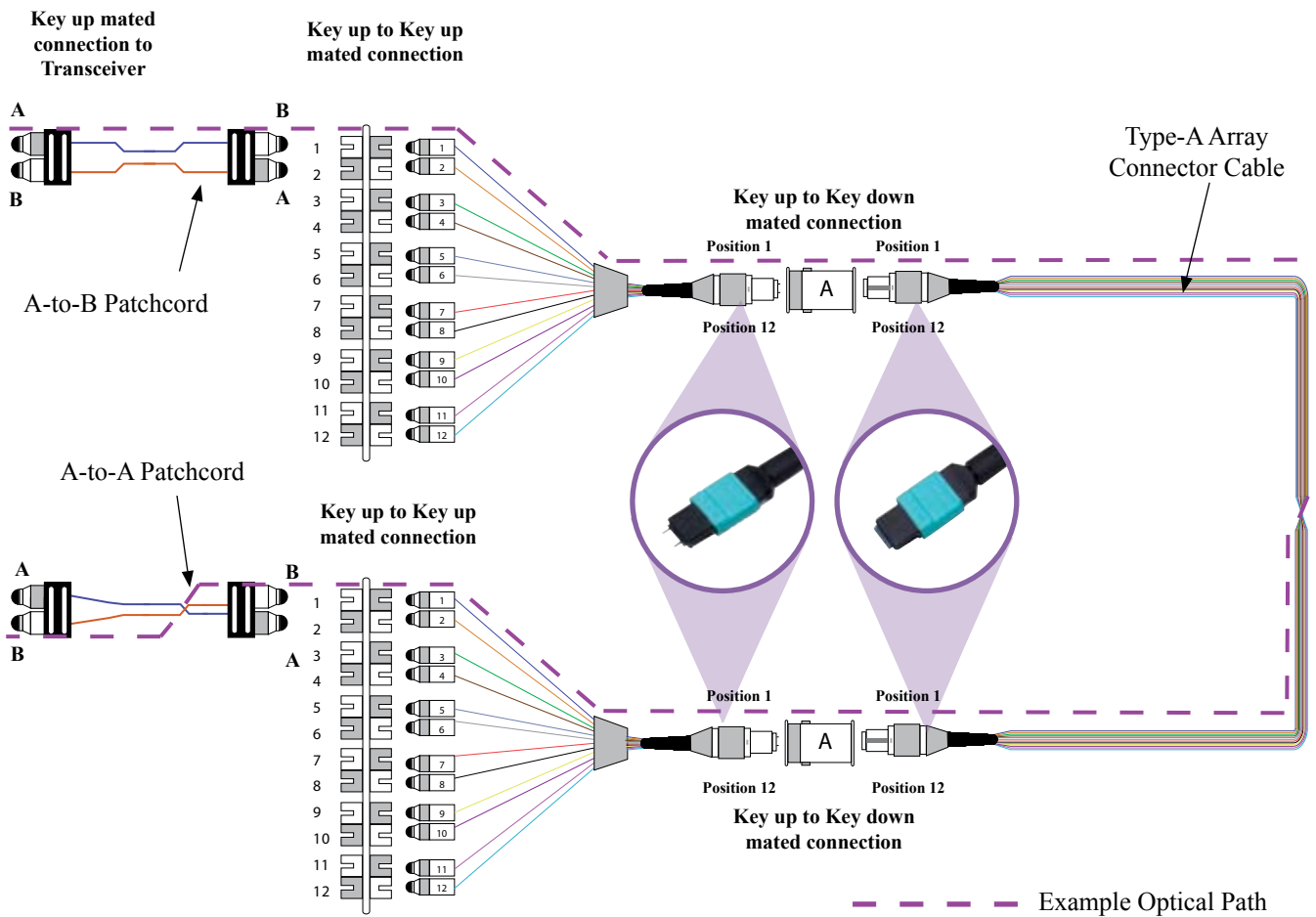
Multi-fibre connectivity for duplex channels

In order to successfully implement multi-fibre connectivity for duplex channels, it is important to maintain bi-directional transmission paths. The cabling must provide the correct signal polarity; the transmitter at one end must connect to the receiver at the other end. These methods of maintaining polarity have been standardised. See TIA/EIA 568-B.1-7 (guidelines for maintaining polarity using array connectors) for more detail. The guidelines cover typical system configurations containing the following:

► Multi-fibre trunks with 12 fibre MTP connectors at either end

► Cassettes or modules where there is an MTP to duplex connector transition

► Duplex patchcords used to connect the active equipment to the cabling system

All of the connectors and adaptors in this system are keyed to make sure the connectors mate with the correct orientation. Keying deals with MPO orientation but it does not ensure fibre pair polarity.

Optronics MTP components are supplied to Method A as a standard. Method B and Method C components are also available. Please refer to the standards and select the correct polarity method to suit your network.

Illustration - Connectivity method A for duplex Channels

Key up mated connection to Transceiver

Key up to Key up mated connection

A

B

B

A

A-to-B Patchcord

A-to-A Patchcord

A

B

B

A

Key up to Key up mated connection

Key up to Key down mated connection

Position 1

Position 1

A

Position 12

Position 12

Type-A Array Connector Cable

Key up to Key down mated connection

Position 1

Position 1

A

Position 12

Position 12

– – – Example Optical Path

For ease of illustration the type -A cable is shown with a twist

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7. Accessories

Installation accessories

As with all fibre optic networking components the cleanliness of MTP connectors is particularly important. It is critical to inspect and clean both sides of a mated connection as contaminants can be transferred from one end-face to the other. Debris crushed between two end-faces can affect network performance and cause permanent damage that could lead to the need to re-terminate connectors. We offer a range of cleaning accessories that will help to avoid this.

MTP cleaning tool

The MTP cleaner is the perfect solution for cleaning MTP bulkheads and connectors. Bulkheads can be cleaned by inserting the tip of the cleaner and rotating the wheel which wipes a fine microfibre cloth across the end-face of the connector. A plastic clip can be attached which enables the user to then clean MTP connector end-faces. You can achieve up to 600 cleans.

Part Number: MALE: MTPRCM

Part Number: FEMALE: MTPRCF

Part Number: REFILL: MTPRCR

OptiPop R cleaner

The OPTIPOP R is a cassette style fibre optic connector cleaner system that can be refilled when required. It uses a tightly woven micro-fibre cleaning material to remove unwanted debris and contaminates off of the connector ferrule end face. This version of the OPTIPOP R cassette cleaning tool is designed specially for cleaning MTP connectors. The customised OPTIPOP R cassette cleaning tool will accommodate the guide pins on male MTP ferrules. The OPTIPOP R cassette cleaning tool is compact and therefore ideal for field use. The anti-static cloth material produces a perfectly cleaned ferrule and minimises contaminant attraction.

Part Number: CLEANMPO

Our Investment in Manufacturing

At all of our manufacturing facilities we have the advantage of both expertise and advanced technology. Our manufacturing processes are unique and controlled at every stage.

From our extensive stocks we are able to cut cable to any length and terminate, test and label every connection to suit your requirement.

Equipment

### Domaille Engineering HDC-5100 Fibre Polishing Machine

The HDC-5100 is recognised as the industry's leading high-performance, polishing machine. Complemented by precision polishing plates holders designed for MT ferrules.

The result is high throughput, high-performance consistent MTP polished ferrule end-faces.

Norland Advantage Multi-fibre Array Interferometer

Norland's industry leading equipment provides verification of our MTP polishing processes. The Interferometer guarantees that all parameters of the polished MT ferrule complies and exceeds the MTP/MPO industry standards.
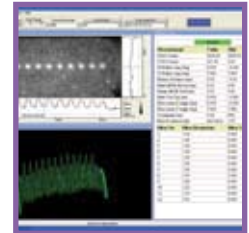
EXFOIQS-12001 Optical Test Set

The EXFO multi channel tester sets under wire our ability to provide high-performance optical cable assemblies and optical test data. The flexibility of the tester provides the complete spectrum of optical testing required for complex and high fibre count cable assemblies.

Method

Quality Control

The Gem Cable testing procedure applies to every stage of manufacturing processes. Not only manufactured assemblies are thoroughly tested but stringent testing procedure applies as well to qualifying and constant control of physical and optical parameters of components.

Simulation Tools

Specially developed software applications helps us to predict insertion loss distribution of our assemblies. We are constantly scrutinising how factors like fibre and ferrule specifications, polish process parameters, geometry or testing influence insertion loss distribution of our products.

Random Mating Testing

Master lead testing insertion loss does not refer to real life scenarios as each connector is mated in the field. Therefore for real insertion loss value random mating testing results are applied.

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Gem Cable UK MTP Manufacturing and R&D Facility

Gem Cable manufacturing facility means fast service for standard and non standard products. In data centre environment every project is different. A UK manufacturing and R&D centre means that even customised and tailored made products can be efficiently configured.

24 Fibre MTP connector

Gem Cable is at forefront of cutting edge MTP technology taking active part in introduction of 24 fibre MTP connector. Emerging next generation network standards like Infiniband and 100Gbps Ethernet utilises parallel optics- 24 fibre MTP is due to come into mainstream MTP connector family. 24 Fibre MTP will make backbone cabling to be even more space and cost efficient.

Multigrade Connector Families –Elite and Premium

In high speed application power budget becomes challenging to control. Gem Cable development effort is to provide ultra low loss MTP and discreet assemblies for multi and singlemode operation. For most demanding applications, MTP Elite and discreet Premium connector's families are the tight choice.

Channel Test Software Development

Putting together all components in contemporary networks can be demanding and challenging especially in low power budget environment. Gem Cable facilitates the design and specification stage by development of channel performance analysis software. You can easily check the performance of your link and check probability of disruptions while creating layout of your network preventing any surprises and potential deployment delays.

FAQs

What is an MT ferrule?

MT stands for mechanical transfer. The MT ferrule is a multi-fibre ferrule in which fibre alignment is dependent on the eccentricity and pitch of the fibre and alignment pin holes. The alignment is dictated by the alignment pins during mating.

The critical elements for fibre alignment are:
1. The ability to hold extreme tolerances for precision during the moulding process

2. The shape, tolerances and material composition of the alignment pins

What is an MPO connector?

MPO is the industry acronym for "multi-fibre push on". The MPO-style connectors are most commonly defined by two different documents:

► IEC-61754-7 is the commonly cited standard for MPO connectors internationally

► EIA/TIA-604-5, also known as FOCIS 5, is the most common standard cited for in the US

What is a MTP connector?

The MTP connector is a high performance MPO connector with multiple engineered product enhancements to improve optical and mechanical performance when compared to generic MPO connectors. MTP connectors and designed and manufactured by US Conec, a joint venture company of Corning, NTT and Furukawa. US Conec is recognised as a leader in the field of multi-fibre connectivity.

The MTP connector is in compliance with all MPO connector standards including EIA/TIA-604-5 FOCIS 5 and IEC-61754-7. The MTP connector is inter-matable with all generic MPO-style connectors that are compliant to these industry standards. Generic MPO connectors are limited in performance and are not able to offer the high performance levels of the MTP connector.

Is the MTP connector an MPO connector?

Yes. The MTP connector is a high performance MPO connector engineered for better mechanical and optical performance.

What makes the MTP connector superior to generic MPO connectors?

The MTP connector has features and benefits that are not available on generic MPO connectors. Some of the key distinctions include:

1. The MTP connector housing is removable. This feature allows the customer to:

► Re-work and re-polish the MT ferrule

► Change the gender after assembly or even in the field

► Scan the ferrule interferometrically after assembly

2. The MTP connector offers ferrule float to improve mechanical performance. This allows two mated ferruled to maintain physical contact while under an applied load. (US Patent 6,085,003)

3. The MTP connector uses tightly held tolerance stainless steel guide pin tips with an elliptical shape. The elliptical shaped guide pin tips improves guidance and reduces guide hole wear. (US Patent 6,886,988)

4. The MTP connector has a metal pin clamp with features for centering the push spring. This feature:

► Eliminates lost pins

► Centres spring force

► Eliminates fibre damage from spring

5. The MTP connector spring design maximizes ribbon clearance for twelve fibre and multifibre ribbon applications to prevent fibre damage.

6. The MTP connector is offered with four standard variations of strain relief boots to meet a wide array of applications.

► Round, loose fibre cable constructions

► Oval jacketed cable

► Bare ribbon fibre

► Short boot which reduces the footprint by 45%. Ideal for use in space limited applications.

Contact us

For further details, please visit our new online catalogue or call our sales team.

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